PROJECT: 23-1036 REST, ASOTIN IMW LOW TECH DESIGN AND RESTORATION

Sponsor: Trout Unlimited Inc. Program: Salmon State Projects Status: Application Resubmitted

Parties to the Agreement

PRIMARY SPONSOR

Trout Unlimited Inc.
Address 1777 N Kent Street, Suite 100
City Arlington **State** VA **Zip** 22201
Org Type Non-Gov-Nonprofit
Vendor # SWV0050369-00
UBI 601215617
Date Org created
Org Notes

link to Organization profile
☐ Org data updated

QUESTIONS - PRIMARY SPONSOR

#1: What date was your organization created?

1959

#2: Is your organization registered as a non-profit with the Washington Secretary of State?

Yes

#2a: Please confirm the Unified Business Identifier (UBI) shown above is correct or provide if blank.

602 988 374

#3: How long has your organization been involved in salmon and habitat conservation?

>20 years

#4: Do your organizational documents (charter, bylaws, or articles of incorporation) include the authority for the protection or enhancement of natural resources or related activities?

Yes

Yes, Trout Unlimited's mission is to conserve, protect, and restore North America's coldwater fisheries and their watersheds.

#5: Do your organizational documents (charter, bylaws, or articles of incorporation) provide for an equivalent successor organization in case the nonprofit dissolves?

Yes

Yes, Trout Unlimited's Bylaws state: Upon the dissolution of the Corporation or the winding up of its affairs, the assets of the Corporation remaining after payment, or provision for payment, of all debts and liabilities shall be distributed exclusively to one or more charitable, religious, scientific, testing for public safety, literary, or educational organizations

SECONDARY SPONSORS

No records to display

MANAGING AGENCY

Recreation and Conservation Office

LEAD ENTITY

Snake River Salmon Rec Bd LE

QUESTIONS

#1: List project partners and their role and contribution to the project.

Washington Department of Fish and Wildlife will potentially participate in coordination and help with permitting.

External Systems

SPONSOR ASSIGNED INFO

Sponsor-Assigned Project Number

Sponsor-Assigned Regions

EXTERNAL SYSTEM REFERENCE

Source	Project Number	Submitter
HWS	23-1036	AFitzgerald

Project Contacts

Contact Name Primary Org	Project Role	Work Phone	Work Email
Kendall Barrameda Rec. and Conserv. Office	Project Manager	(360) 764-9086	Kendall.Barrameda@rco.wa.gov
Aaron Penvose Trout Unlimited Inc.	Project Contact	(509) 888-0970	apenvose@tu.org
Elizabeth Keksi Eco Logical Research Inc.	Alt Project Contact	(360) 721-3751	eliza.keksi@anabranchsolutions.com
Ali Fitzgerald Snake River Salmon Rec Bd LE	Lead Entity Contact	(509) 382-4115	ali@snakeriverboard.org
Stephen Bennett Eco Logical Research Inc.	Consultant	(435) 757-5668	bennett.ecological@gmail.com

Worksites & Properties

#	Worksite Name
#1	Charley Creek river mile 2.5-7.5

Restoration	Property Name
✓	Asotin Wildlife Management Area 1

#2 South Fork Asotin Creek river mile 0-2.5

Restoration	Property Name
✓	Asotin Wildlife Management Area 2

#3 North Fork Asotin Creek river mile 0-5

Restoration	Property Name
✓	Asotin Wildlife Management Area 3

Worksite Map & Description

Worksite #1: Charley Creek river mile 2.5-7.5

WORKSITE ADDRESS

Street Address

City, State, Zip Asotin WA 99402

Worksite #2: South Fork Asotin Creek river mile 0-2.5

WORKSITE ADDRESS

Street Address

City, State, Zip Asotin WA 99402

Worksite #3: North Fork Asotin Creek river mile 0-5

WORKSITE ADDRESS

Street Address

City, State, Zip Asotin WA 99402

Worksite Details

Worksite #1: Charley Creek river mile 2.5-7.5

SITE ACCESS DIRECTIONS

From Clarkston, WA head east on Highway 129 and turn left onto Asotin Creek Road just before entering the town of Asotin, WA. Drive approximately 12 miles up Asotin Creek Road. Charley Creek enters Asotin Creek at approximately river mile 13.8,

TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Steelhead-Snake River, Asotin Creek, Threatened	✓	✓	✓	Unknown

Reference or source used

Snake River Salmon Recovery Plan and Northwest Marine Fisheries Service. 2017. ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon (Oncorhynchus tshawytscha) & Snake River Basin Steelhead (Oncorhynchus mykiss). Portland OR.

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
None	

Questions

#1: Give street address or road name and mile post for this worksite if available.

na

Worksite #2: South Fork Asotin Creek river mile 0-2.5

SITE ACCESS DIRECTIONS

From Clarkston, WA head east on Highway 129 and turn left onto Asotin Creek Road just before entering the town of Asotin, WA. Drive approximately 14.5 miles up Asotin Creek Road and North Fork and South Fork Asotin Creek begin at the confluence just upstream from the bridge crossing known as the "Forks".

TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Steelhead-Snake River, Asotin Creek, Threatened	✓	✓	✓	Unknown

Reference or source used

Snake River Salmon Recovery Plan and Northwest Marine Fisheries Service. 2017. ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon (Oncorhynchus tshawytscha) & Snake River Basin Steelhead (Oncorhynchus mykiss). Portland OR.

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Bull Trout	
Lamprey	

Questions

#1: Give street address or road name and mile post for this worksite if available.

na

Worksite #3: North Fork Asotin Creek river mile 0-5

SITE ACCESS DIRECTIONS

From Clarkston, WA head east on Highway 129 and turn left onto Asotin Creek Road just before entering the town of Asotin, WA. Drive approximately 14.5 miles up Asotin Creek Road and North Fork and South Fork Asotin Creek begin at the confluence just upstream from the bridge crossing known as the "Forks".

TARGETED ESU SPECIES

Species by ESU	Egg Present	Juvenile Present	Adult Present	Population Trend
Chinook-Snake River Spring/Summer, Asotin Creek, Threatened	✓	✓	✓	
Steelhead-Snake River, Asotin Creek, Threatened	✓	✓	✓	

Reference or source used

Snake River Salmon Recovery Plan and Northwest Marine Fisheries Service. 2017. ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon (Oncorhynchus tshawytscha) & Snake River Basin Steelhead (Oncorhynchus mykiss). Portland OR.

TARGETED NON-ESU SPECIES

Species by Non-ESU	Notes
Bull Trout	
Lamprey	

Questions

#1: Give street address or road name and mile post for this worksite if available.

na

Project Location

RELATED PROJECTS

Projects in PRISM

PRISM Number	Project Name	Program Name	Current Status	Relationship Type	Notes
22-1953 C	Asotin IMW Monitoring PSMFC 2023	Pacific States Projects	Active	Current Phase	

Projects not in PRISM

Project Number	Project Name	Current Status	Relationship Type	Project Funder
	Asotin Post Fire Mitigation and Bull Trou	In Progress	Current Phase	USFWS

Related Project Notes

The Project is located within the Asotin Creek Intensively Monitored Watershed

study area which is located within the Asotin Creek Watershed and specifically within the Asotin Wildlife Management Area. The actions will focus on river mile 2.5-7.5 of Charley Creek (~ 5 miles), the lower 5 miles of North Fork Asotin Creek and the lower 2.5 miles of South Fork Asotin Creek. All of the project area in Charley Creek and the North Fork and South Fork Asotin Creek sare within the Snake River Summer Steelhead MSA and priority restoration reaches.

Questions

#1: Project location. Describe the geographic location, water bodies, and the location of the project in the watershed, i.e. nearshore, tributary, main-stem, off-channel, etc.

Project is located on the mainstem of three tributaries to Asotin Creek in southeast Washington; Charley Creek, North Fork Asotin Creek, and South Fork Asotin Creek. The actions will focus on river mile 2.5-7.5 of Charley Creek (~ 5 miles), the lower 5 miles of North Fork Asotin Creek and the lower 5 miles of South Fork Asotin Creek.

#2: How does this project fit within your regional recovery plan and/or local lead entity's strategy to restore or protect salmonid habitat? Cite section and page number.

This project fits into the Snake River Salmon Recovery Plan for SE Washington's (SRSRB 2011) approach to habitat restoration (Chapter 6.3.2, p. 193-196).

Charley Creek, North Fork Asotin Creek, and South Fork Asotin Creek are within the Asotin Creek watershed, a major spawning area (MSA) for ESA-listed Snake River steelhead and Chinook.

#3: Is this project part of a larger overall project?

Yes

#3a: How does this project fit into the sequencing of the larger project?

We have been working on Charley Creek, North Fork and South Fork Asotin Creek for over a decade to restore stream processes and improve spawning and rearing habitat for Snake River steelhead and Chinook by increasing in-stream habitat complexity, floodplain connectivity, and riparian function.

It has proven difficult to widen and aggrade treatment channels, and connect side-channel and floodplain habitats despite using PALS to try and force bank erosion, overbank flow, and channel widening.

The intent of the proposed project is to continue to implement the adaptive management plan of the IMW, identify and remove portions of confining berms that are preventing greater side-channel and floodplain connection, and restore an additional 5-6 miles of the study streams, while maintaining experimental controls in each stream (Wheaton et al. 2012, Bouwes et al. 2016a).

#4: Is the project on State Owned Aquatic Lands? Please contact the Washington State Department of Natural Resources to make a determination. **Aquatic Districts and Managers**

No

Property Details

Property: Asotin Wildlife Management Area 1 (Worksite #1: Charley Creek river mile 2.5-7.5)

✓ **Restoration**

LANDOWNER

Name	Washington Department of Fish and Wild
Address	2315 N. Discovery Place
City	Spokane Valley
State	WA Zip 99216
Type	State

CONTROL & TENURE

Instrument Type	Landowner Agreement
Timing	Proposed
Term Length	Fixed # of years
# Yrs	10
Expiration Date	09/30/2033
Note	

Property: Asotin Wildlife Management Area 2 (Worksite #2: South Fork Asotin Creek river mile 0-2.5)

✓ **Restoration**

LANDOWNER

Name	Washington Department of Fish and Wild
Address	2315 N. Discovery Place
City	Spokane Valley
State	WA Zip 99216
Type	State

CONTROL & TENURE

Instrument Type	Landowner Agreement
Timing	Proposed
Term Length	Fixed # of years
# Yrs	10
Expiration Date	09/30/2030
Note	

Property: Asotin Wildlife Management Area 3 (Worksite #3: North Fork Asotin Creek river mile 0-5)

✓ **Restoration**

LANDOWNER

Name	Washington Department of Fish and Wild
Address	2315 N. Discovery Place
City	Spokane Valley
State	WA Zip 99216
Type	State

CONTROL & TENURE

Instrument Type	Landowner Agreement
Timing	Proposed
Term Length	Fixed # of years
# Yrs	10
Expiration Date	09/30/2030
Note	

Project Proposal

Project Description

Trout Unlimited is sponsoring a design and restoration project utilizing lessons learned from the Asotin Creek IMW to implement further restoration actions to restore stream processes and improve spawning and rearing habitat for Snake River steelhead and Chinook. These actions will increase in-stream habitat complexity, floodplain connectivity, and riparian function within the Asotin Creek MSA targeting priority restoration reaches on Charley Creek, North Fork, and South Fork Asotin creeks. All work will be done within WDFW property in the Asotin Wildlife Management Area. In phase 1, we will use existing LiDAR to identify key confining features (e.g., old berms) for design and removal. Confining features will be prioritized by extent of unconfined habitat potential and removal will be done using a mini excavator with minimal intervention to keep within the "let the system do the work approach" of the IMW. Phase 2 includes maintenance on existing restoration sections, and the design and installation of low-tech process-based structures (e.g., PALS and BDAs) within the upper 2.5 miles of unrestored sections in Charley Creek and the North Fork and the lower 1.25 miles in the South Fork. Total anticipated restoration footprint would be 6-8 miles over 3 years.

Project Questions

Project Application Report - 23-1036

#1: Problem statement. What are the problems your project seeks to address? Include the source and scale of each problem. Describe the site, reach, and watershed conditions. Describe how those conditions impact salmon populations. Include current and historic factors important to understand the problems.

The Asotin Creek watershed supports populations of steelhead, Chinook, lamprey, and bull trout that are limited by degraded spawning and rearing habitat conditions due to historic removal of instream and riparian wood and trees, trapping of beaver, successive large floods, and straightening of channels. Structural starvation and poor floodplain connectivity are the key limiting factors this project seeks to address as it limits instream complexity, frequency of overbank flow, and extent and function of active floodplain and riparian area, which limits production and productivity for the impacted populations.

The Asotin Creek Intensively Monitored Watershed (IMW) is an ongoing, long-term watershed-scale experiment in southeast Washington, established in 2008 to test the effectiveness of large woody debris (LWD) additions at improving stream complexity, pool frequency, side-channel and floodplain connection, and riparian health. Asotin Creek is managed as a wild steelhead refuge, and Snake River summer-run steelhead are the focal species of the IMW. Stream habitat quality in Asotin Creek and tributaries was found to be limiting steelhead populations due to a lack on instream complexity, large woody debris, deep pools, off-channel, side-channel, and floodplain connection (SRSRB 2011, Bennett and Bouwes 2009, Wheaton et al. 2012).

The IMW is implemented in three Asotin Creek tributaries: Charley Creek, North Fork Asotin Creek (North Fork), and South Fork Asotin Creek. Intensive monitoring of water temperature, discharge, habitat, and juvenile steelhead has been ongoing in the study streams since 2008 (Bennett et al. 2021). Pre-restoration monitoring was conducted from 2008-2012. Then one 2.5-mile-long section in each study stream was restored using post-assisted log structures (PALS) which were developed in Asotin as part of a growing “low-tech process-based” restoration approach (Wheaton et al. 2012). An additional 1.5 miles of South Fork was restored in 2016 to extend one treatment to ~ 4 miles. Between 2012-2016, 8.7 miles of the study streams were treated while 14 miles were maintained as controls.

To date, the Asotin Creek IMW has demonstrated significant increases in LWD and log jam frequency (193-962% increase), geomorphic complexity (23-110%), pool frequency (22-58%), abundance of juvenile steelhead (15-31%), and an increase in juvenile migrants (30-77%) in treatment compared to control sections across the three study streams (Bennett et al. 2021). These increases were initiated by the initial treatments, but also increased over time as we conducted maintenance and enhancement (i.e., increasing LWD density and adding whole trees) on the existing treatments. The habitat and fish responses were mostly attributed to increased complexity within the existing channel and with only small increases in off-channel, side-channel, and floodplain connection (~5-25% increase – we are still evaluating this metric). It has proven difficult to widen and aggrade treatment channels, and connect side-channel and floodplain habitats despite using PALS to try and force bank erosion, overbank flow, and channel widening. The banks are armored by dense alder roots and in many places old berms composed of large gravel and cobbles are preventing overbank flow and limiting the streams access to side-channels and floodplain areas.

The goals of the project are to increase the restoration footprint of the IMW (from ~40% treated to 66% of the IMW study area treated) and significantly increase the amount of side-channel and floodplain connection. This is expected to increase the production and productivity of juvenile steelhead and the Asotin IMW is uniquely suited to detect habitat and populations changes, document the effectiveness, provide lessons learned, and management implications regarding this increasingly popular low-tech process-based restoration approach.

#2: Describe the limiting factors, and/or ecological concerns, and limiting life stages (by fish species) that your project expects to address.

The Asotin Wildlife Management Area and Asotin Creek Watershed are an ideal area to implement the IMW due to the limited infrastructure and risks (i.e., most of the historic floodplain could be connected without impacting roads or other infrastructure), the study streams provide a wide range of stream types to test the effectiveness of LWD additions, the system is a wild steelhead refuge so there is limited hatchery influence (i.e., so increases in fish abundance can more easily be linked to restoration rather than hatchery supplementation), and the limiting factors are clearly identified and restoration processes needed to reach sustainability are understood (i.e., improve instream complexity and overbank flows, which will lead to increased riparian function and extent, and eventually sustained LWD recruitment).
Since 2016, we have implemented maintenance and enhancement of the original 8.7 miles of restoration treatments in the study stream as per our adaptive management plan. We have rebuilt some structures that washed out, added posts and wood to other structures that had lost wood, and increasingly we have felled live and dead alder, pine, and Douglas-fir in or near the floodplain to increase the wood loading and force greater hydraulic and geomorphic complexity, and side-channel and floodplain connection. This is in line with the basic principles of low-tech process-based restoration, whereby add wood to the streams, monitor the responses, and if the responses are not meeting the expected outcomes (i.e., high complexity and greater lateral connection) we push the system further by adding more wood. This approach is letting the system do much of the work (i.e., erosion and deposition) and using the minimal amount of effort to reach the project goals. To date, it has become clear that although we have documented large increases in LWD frequency and habitat complexity, connection of historic side-channels and floodplain connection has been more difficult. Hence, we are proposing to use targeted berm removal instead of erosion caused by structure placement, to increase side-channel and floodplain connection.

Limiting factors in the watershed are structural starvation, poor floodplain connectivity, lack of habitat quantity and quality (SRSRB 2011). Lack of habitat diversity impacts all life stages of steelhead and Chinook. This project would address these limiting factors by providing added structure and habitat complexity with the implementation of PALs and BDAs, and increasing habitat quantity by increasing floodplain connectivity with the removal of confining features. These actions would improve sediment sorting, increase habitat complexity with increased pool and bar frequency, and increase floodplain connectivity that will provide additional cover for adult holding, juvenile rearing, and improve spawning habitat for steelheead, Chinook, bull trout, and lamprey.

#3: What are the project goals? The goal of the project should be to solve identified problems by addressing the root causes. Then clearly state the desired future condition. Include which species and life stages will benefit from the outcome, and the time of year the benefits will be realized. **Example Goals and Objectives**

The overall goals are to take lessons learned from the Asotin IMW and further promote self-sustaining, natural stream processes that improve spawning and rearing habitat for Snake River steelhead and Chinook through the strategic and opportunistic removal of berms blocking off potential side channel and floodplain habitat, and installation of PALs and BDAs.

The intent of the proposed project is to continue to implement the adaptive management plan of the IMW, identify and remove portions of confining berms that are preventing greater side-channel and floodplain connection, and restore an additional 5-6 miles of the study streams, while maintaining experimental controls in each stream (Wheaton et al. 2012, Bouwes et al. 2016a).
The goals of the project are to increase the restoration footprint of the IMW (from ~40% treated to 66% of the IMW study area treated) and significantly increase the amount of side-channel and floodplain connection. This is expected to increase the production and productivity of juvenile steelhead and the Asotin IMW is uniquely suited to detect habitat and populations changes, document the effectiveness, provide lessons learned, and management implications regarding this increasingly popular low-tech process-based restoration approach.

#4: What are the project objectives? Objectives support and refine biological goals, breaking them down into smaller steps. Objectives are specific, quantifiable actions the project will complete to achieve the stated goal. Each objective should be SMART (Specific, Measurable, Achievable, Relevant, and Time-bound). **Example Goals and Objectives**

1. Identify confining berms for potential opening and floodplain connection in Charley Creek, South Fork Asotin Creek, and North Fork Asotin Creek
2. Rank the berms based on maximizing side-channel and floodplain connection
3. Use a mini-excavator or other suitable machine to open holes in 20-30 key confining berms (not complete removal)
4. Reconnect 10-15 acres of new floodplain and 2.0-3.0 miles of side-channels through confining berm removal
5. Install a combination of 175-250 post-assisted log structures (PALS), 175-250 whole trees, and 20-30 beaver dam analogues (BDAs) in three sections of the IMW (section 3 of Charley Creek (2.5 miles), and section 2 of North Fork (2.5 miles), and the lower 1.25 mi of section 1 of the South Fork, totaling 6 miles of treatment (see Appendix C in Basis of Design Report for locations)
6. Promote pool formation, sediment sorting, increased geomorphic complexity, as well as creating or enhancing 100-125 new pools (increase pool frequency > 20 per stream mile) in the 6 miles of total proposed treatment area within Charley Creek, South Fork Asotin Creek, and North Fork Asotin Creek

#5: Scope of work and deliverables. Provide a detailed description of each project task/element. With each task/element, identify who will be responsible for each, what the deliverables will be, and the schedule for completion.

1. LiDAR and field review of confining features - March 2024
2. Removal Planning, Design and Permitting - March 2024
3. Removal of confining features - December 2025
4. LTPBR planning, design, permitting - June 2024
5. Implementation of wood addition Charley Creek, North Fork and South Fork Asotin Creek Dec 2025

#6: What are the assumptions and physical constraints that could impact whether you achieve your objectives? Assumptions and constrains are external conditions that are not under the direct control of the project, but directly impact the outcome of the project. These may include ecological and geomorphic factors, land use constraints, public acceptance of the project, delays, or other factors. How will you address these issues if they arise?

Most restoration structures will be secured with posts so the assumption is that a majority of them will not move. Some structures or parts of structures may be lost during high flows. Wood from these structures will likely accumulate on structures that are downstream. Even structures that are partially lost can create complex habitat and can be maintained during subsequent phases.
Habitat responses are dependent on at least moderate spring flows to redistribute sediments and induce changes to the stream channel.
The recovery of riparian function is dependent upon aggrading the channel and improving floodplain connectivity which takes multiple high flow events.
Scour and pool formation, sediment redistribution, and floodplain connectivity are all dependent upon having sufficiently high flows during runoff for these geomorphic processes to take place.
While this specific issue cannot be addressed directly, direct outcomes of installation that benefit salmonids are increases in cover and velocity refuge.

#7: How have lessons learned from completed projects or monitoring studies informed this project?

Previous restoration on Asotin Creek and other streams in the region (Tumalum Creek, Pataha Creek, Little Tucannon River) and monitoring in the Asotin IMW have shown improvements in habitat conditions for Snake River steelhead and Chinook including instream habitat complexity and sediment sorting.

Lessons learned include:
- Implement project in phases in order to apply adaptive management strategies and repair/add onto existing structures.
- Building in high densities allows structures to work with each other and helps accumulate any lost structures on existing ones.
- Structure complexes should be built with a variety of structure types that have different design purposes (split flows, connect side channels, recruit sediment, collect sediment).
- Structures should be built relatively large and with lower (e.g., Bankfull Elevation) profiles to sustain high flows. Most structures should constrict all or most of the channel to have the most geomorphic effect.

#8: Describe the alternatives considered and why the preferred was chosen.

Alternative 1, we could continue to conduct maintenance on the existing restoration treatments as we have since 2016. This is a reasonable alternative as we have already demonstrated significant increases in LWD frequency which have been linked to changes in hydraulic complexity, which lead to increases in geomorphic complexity, and ultimately to moderate increases in juvenile abundance and productivity (i.e., more smolts leaving treatment versus control areas). We have also seen modest increases in side-channel and floodplain connection. However, what Alternative 1 lacks is the ability to test the hypothesis that greater side-channel and floodplain connection would lead to higher increases in fish abundance and productivity. This would be a significant accomplishment for the IMW and provide greater confidence to the restoration community that LTPBR methods can be very effective.

Alternative 2, we could use a Stage 0 approach where the berms and confining features in the floodplain could be “reset” to a common elevation, wood could be added, and the system left to re-establish an anastomosing plane form (Powers et al. 2018). This alternative is process-based but certainly not low-tech. This would not be in step with the approach the IMW had taken from the beginning which was to test LTPBR approaches. This alternative would also be highly disruptive to the extensive riparian areas already established. This would not expand the IMWs ability to test LTPBR but limit it to provide any more learning that has already been accomplished to date. It is also not necessarily an appropriate approach in these streams as they are in confined and partly confined valleys and likely did not support anastomosing plane forms historically. Another research goal of the IMW will be to better define the reference conditions of these confined and partly confined Columbia Plateau streams to aid in better defining restoration goals.

#9: How were stakeholders consulted in the development of this project? Identify the stakeholders, their concerns or feedback, and how those concerns were addressed.

We meet with the Snake River Salmon Recovery Board and the Regional Technical Team often to discuss the IMW.

#10: Does your project address or accommodate the anticipated effects of climate change?

Yes

#10a: How will your project be climate resilient given future conditions?

Decreased base flows and higher stream temperatures are imminent in the region due to changes in hydrologic regimes caused by climate change. Side-channel and floodplain connection, the placement of PALS and improvement of riparian function may help mitigate the effects of climate change by reducing water temperature fluctuations, reducing peak flows, and increasing base flows.

#10b: How will your project increase habitat and species adaptability?

BDAs and PALS create habitat complexity which fish use at different spatial and temporal scales (Wathen et al. 2018). This habitat heterogeneity provide conditions (i.e., flows, temperature) that allow adaptability for species in a warming climate.

#11: Describe the sponsor's experience managing this type of project. Describe other projects where the sponsor has successfully used a similar approach.

TU has an extensive history managing instream flow, fish passage, habitat restoration projects and several successful years of
the managing a BDA and Beaver Project.

#12: Will veterans (including the veterans conservation corps) be involved in the project? If yes, please describe.

No

Restoration Supplemental

#1: What level of design (per Appendix D) have you completed? Please attach.
Conceptual

#1a: What level of design will be produced prior to construction?
Final

#2: Will (or did) a licensed professional engineer design the project?
No

#2a: Describe the qualifications of the design team.

The team will be experienced in all aspects of designing and building low-tech process-based restoration structures (PALS & BDAs). Design experience comes from multiple projects in the region including in the Asotin IMW, Pataha, Alpowa, and Tumalum creeks, and the L. Tucannon River. WDFW will also be consulted and their staff utilized for the design on WDFW property.

#3: Does the project include measures to stabilize an eroding stream bank?
No

#4: Is the primary activity of the project invasive species removal?
No

#5: Is the primary activity of the project riparian planting?
No

#6: Describe the steps you will take to minimize the introduction of invasive species during construction and restoration. Consider how you will use un-infested materials and clean equipment entering and leaving the project area.

The sponsor will use native materials on site or locally sourced to build BDAs and PALS. All equipment used for the project will be cleaned before and after each site visit.

#7: Describe the long-term stewardship and maintenance obligations for the project.

We do not expect any long-term stewardship or maintenance obligations for this project although future funding may be sought for structure enhancement. If additional funds are available after attaining restoration metrics, the Grantee will, if necessary, enhance or repair the structures. However, these structures are designed to be dynamic and work as a group and therefore, only some maintenance should inherently be required. All materials will be biodegradable.

Restoration Metrics

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Worksite: Charley Creek river mile 2.5-7.5 (#1)

Miles of Stream and/or Shoreline Treated or Protected (C.0.b)	3.
Project Identified In a Plan or Watershed Assessment (C.0.c)	Northwest Marine Fisheries Service. 201 ESA Recovery Plan for Snake Riv Spring/Summer Chinook Salm (Oncorhynchus tshawytscha) & Snake Riv Basin Steelhead (Oncorhynchus mykis Portland, O
Priority in Recovery Plan	The project is located in a major spawni area for steelhead and a priority restorati reach in the Snake River Salmon Recove Plan and 3 year workpl
Type Of Monitoring (C.0.d.1)	No
Monitoring Location (C.0.d.2)	No monitoring complet

INSTREAM HABITAT PROJECT

Total Miles Of Instream Habitat Treated (C.4.b)	2.

Channel reconfiguration and connectivity (C.4.c.1)

Total cost for Channel reconfiguration and connectivity	$16,9
Type of change to channel configuration and connectivity (C.4.c.2)	Creation/Connection to C Channel Habi
Miles of Stream Treated for channel reconfiguration and connectivity (C.4.c.3)	0.
Miles of Off-Channel Stream Created or Connected (C.4.c.4)	1.
Acres Of Channel/Off-Channel Connected Or Added (C.4.c.5)	4
Instream Pools Created/Added (C.4.c.6)	

Channel structure placement (C.4.d.1)

Total cost for Channel structure placement	$93,9
Material Used For Channel Structure (C.4.d.2)	Individual Lo (Unanchore
	Logs Fastened Togeth (Logja
	Stumps With Roots Attach (Rootwa
Miles of Stream Treated for channel structure placement (C.4.d.3)	5.
Pools Created through channel structure placement (C.4.d.5)	
Number of structures placed in channel (C.4.d.7)	2

CULTURAL RESOURCES

Cultural resources

Total cost for Cultural resources	$3,0
Acres surveyed for cultural resources	20.

PERMITS

Obtain permits

Total cost to Obtain permits	$1,5
Number of permits required for implementation of project	

ARCHITECTURAL & ENGINEERING

Architectural & Engineering (A&E)

Total cost for Architectural & Engineering (A&E)	$19,2

AGENCY INDIRECT COSTS

Agency Indirect

Total cost for Agency Indirect	$16,5

Worksite: South Fork Asotin Creek river mile 0-2.5 (#2)

Miles of Stream and/or Shoreline Treated or Protected (C.0.b)	2.

Project Identified In a Plan or Watershed Assessment (C.0.c)

Northwest Marine Fisheries Servic
2017.ESA Recovery Plan for Snake Riv
Spring/Summer Chinook Salm
Oncorhynchus tshawytscha) & Snake Riv
Basin Steelhead (Oncorhynchus mykis
Portland, O

Priority in Recovery Plan	The project is located in a major spawni area for steelhead and a priority restorati reach in the Snake River Salmon Recove Plan and 3 year workpla
Type Of Monitoring (C.0.d.1)	Implementation Monitori No
Monitoring Location (C.0.d.2)	No monitoring complet Downstrea Ons Upslo Upstrea

ESTUARINE / NEARSHORE PROJECT

FISH PASSAGE IMPROVEMENT

FISH SCREENING PROJECT

INSTREAM FLOW PROJECT

INSTREAM HABITAT PROJECT

Total Miles Of Instream Habitat Treated (C.4.b)	1.

Beavers (C.4.h.1)

Channel reconfiguration and connectivity (C.4.c.1)

Total cost for Channel reconfiguration and connectivity	$14,1
Type of change to channel configuration and connectivity (C.4.c.2)	Channel Bed Restor Creation of Instream Poo Creation/Connection to C Channel Habi Levee removal/Alterati Meanders Add No
Miles of Stream Treated for channel reconfiguration and connectivity (C.4.c.3)	0.
Miles of Off-Channel Stream Created or Connected (C.4.c.4)	0.
Acres Of Channel/Off-Channel Connected Or Added (C.4.c.5)	3
Instream Pools Created/Added (C.4.c.6)	1

Channel structure placement (C.4.d.1)

Total cost for Channel structure placement	$78,2
Material Used For Channel Structure (C.4.d.2)	Deflectors/Bar Flood Fenci Gabio Individual Logs (Anchore Individual Lo (Unanchore Logs Fastened Togeth (Logja No Other Engineered Structur Rocks/Boulders (Fasten Or Anchore Rocks/Boulde (Unanchore Stumps With Roots Attach (Rootwa We
Miles of Stream Treated for channel structure placement (C.4.d.3)	1.
Pools Created through channel structure placement (C.4.d.5)	1
Number of structures placed in channel (C.4.d.7)	1

Plant removal/control (C.4.g.1)

Predator removal project (C.4.i.1)

Spawning gravel placement (C.4.f.1)

Streambank stabilization (C.4.e.1)

Unspecified or other instream habitat project. (C.4.j.1)

PRE-RESTORATION ACQUISITIONS AND NURSERY OPERATIONS PROJECT

RIPARIAN HABITAT PROJECT

SITE STEWARDSHIP PROJECT

UPLAND HABITAT AND SEDIMENT PROJECT

WATER QUALITY PROJECT

WETLAND PROJECT

CULTURAL RESOURCES

Cultural resources

Total cost for Cultural resources	$2,5
Acres surveyed for cultural resources	30.

PERMITS

Obtain permits

Total cost to Obtain permits	$1,0
Number of permits required for implementation of project	

ARCHITECTURAL & ENGINEERING

Architectural & Engineering (A&E)

Total cost for Architectural & Engineering (A&E)	$16,0

AGENCY INDIRECT COSTS

Agency Indirect

Total cost for Agency Indirect	$13,8

Project Application Report - 23-1036

Worksite: North Fork Asotin Creek river mile 0-5 (#3)

Miles of Stream and/or Shoreline Treated or Protected (C.0.b)	3.
Project Identified In a Plan or Watershed Assessment (C.0.c)	Northwest Marine Fisheries Servic 2017.ESA Recovery Plan for Snake Riv Spring/Summer Chinook Salm Oncorhynchus tshawytscha) & Snake Riv Basin Steelhead (Oncorhynchus mykis Portland, O
Priority in Recovery Plan	The project is located in a major spawni area for steelhead and a priority restorati reach in the Snake River Salmon Recove Plan and 3 year workpla
Type Of Monitoring (C.0.d.1)	Implementation Monitori No
Monitoring Location (C.0.d.2)	No monitoring complet Downstrea Ons Upslo Upstrea

ESTUARINE / NEARSHORE PROJECT

FISH PASSAGE IMPROVEMENT

FISH SCREENING PROJECT

INSTREAM FLOW PROJECT

INSTREAM HABITAT PROJECT

PRE-RESTORATION ACQUISITIONS AND NURSERY OPERATIONS PROJECT

RIPARIAN HABITAT PROJECT

SITE STEWARDSHIP PROJECT

UPLAND HABITAT AND SEDIMENT PROJECT

WATER QUALITY PROJECT

WETLAND PROJECT

CULTURAL RESOURCES

Cultural resources

Total cost for Cultural resources	$4,5
Acres surveyed for cultural resources	18.

PERMITS

Obtain permits

Total cost to Obtain permits	$2,5
Number of permits required for implementation of project	

ARCHITECTURAL & ENGINEERING

Architectural & Engineering (A&E)

Total cost for Architectural & Engineering (A&E)	$28,9

AGENCY INDIRECT COSTS

Agency Indirect

Total cost for Agency Indirect	$24,8

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Overall Project Metrics

COMPLETION DATE	
Projected date of completion	12/31/20

Restoration Cost Estimates

Worksite #1: Charley Creek river mile 2.5-7.5

Category	Work Type	Estimated Cost	Note
Agency Indirect Costs	Agency Indirect	$16,576	
Cultural Resources	Cultural resources	$3,000	
Instream Habitat Project	Channel reconfiguration and connectivity (C.4.c.1)	$16,920	
	Channel structure placement (C.4.d.1)	$93,900	
Permits	Obtain permits	$1,500	
	Subtotal:	$131,896	
Admin, Architecture, and Engineering		$19,296	
	Total Estimate For Worksite:	$151,192	

Worksite #2: South Fork Asotin Creek river mile 0-2.5

Category	Work Type	Estimated Cost	Note
Agency Indirect Costs	Agency Indirect	$13,813	
Cultural Resources	Cultural resources	$2,500	
Instream Habitat Project	Channel reconfiguration and connectivity (C.4.c.1)	$14,100	
	Channel structure placement (C.4.d.1)	$78,250	
Permits	Obtain permits	$1,000	
	Subtotal:	$109,663	
Admin, Architecture, and Engineering		$16,080	
	Total Estimate For Worksite:	$125,743	

Worksite #3: North Fork Asotin Creek river mile 0-5

Category	Work Type	Estimated Cost	Note
Agency Indirect Costs	Agency Indirect	$24,863	
Cultural Resources	Cultural resources	$4,500	
Instream Habitat Project	Channel reconfiguration and connectivity (C.4.c.1)	$25,380	
	Channel structure placement (C.4.d.1)	$140,850	
Permits	Obtain permits	$2,500	
	Subtotal:	$198,093	
Admin, Architecture, and Engineering		$28,944	
	Total Estimate For Worksite:	$227,037	

Summary

Total Estimated Costs Without AA&E:	$439,652
Total Estimated AA&E:	$64,320
Total Estimated Restoration Costs:	$503,972

Cost Summary

	Estimated Cost	Project %	Admin/AA&E %
Restoration Costs			
Restoration	$439,652		
Admin, Architecture, and Engineering	$64,320		16.73 %

	Estimated Cost	Project %	Admin/AA&E %
SUBTOTAL	$503,972	100.00 %	
Total Cost Estimate	$503,972	100.00 %	

Funding Request and Match

FUNDING PROGRAM

Salmon State Projects	$454,472	90.178026

SPONSOR MATCH

Other In-Kind Contributions	Donated Equipment	
Amount		$2,500.
Funding Organization		Priva
Other In-Kind Contributions	Donated Materials	
Amount		$10,000.
Funding Organization		Department of Fish and Wildlife (WDFV USFS; Priva
Other In-Kind Contributions	Donated Materials	
Amount		$10,000.
Funding Organization		US Forest Service Umatilla National Fore (USF
Other In-Kind Contributions	Donated Services	
Amount		$10,000.
Funding Organization		Priva
Other In-Kind Contributions	Donated Services	
Amount		$17,000.
Funding Organization		Priva

Match Total:	$49,5009.821974 %
Total Funding Request (Funding + Match):	$503,972100.000000

Questions

#1: Explain how you determined the cost estimates

Actual costs, based on projected additional resources and time commitments.

Cultural Resources

Cultural Resource Areas

Worksite #1: Charley Creek river mile 2.5-7.5

Area: Charley Creek

#1: Provide a description of the project actions at this worksite (acquisition, development and/or restoration activities that will occur as a part of this project)

Restoration activities include placing beaver dam analogues (BDA) and post assisted log structures (PALS) in the stream, driving posts into the stream bed to support structures, and minimal use of a mini excavator to remove confining berms. Additional actions would be transporting large wood by hand (or use of a griphoist) from the adjacent floodplain and hillslopes to the stream channel.

#2: Describe all ground disturbing activities (length, width and depth of disturbance and equipment utilized) that will take place in the Area of Potential Effect (APE). Include the location of any construction staging or access roads associated with your project that will involve ground disturbance.

For each BDA built , approximately 0.25-0.5 cubic yards of streambed or floodplain will be moved using 5 gallon buckets and used to build BDAs on upstream end. No ground disturbance is expected with PALS installations. BDAs and PALS are installed using a hydraulic post-pounder to install wooden stakes directly into the streambed to act as anchors for the material. Posts are typically driven 3 to 4 feet deep.

#3: Describe any planned ground disturbing pre-construction/restoration work. This includes geo-technical investigation, fencing, demolition, decommissioning roads, etc.

Ground disturbance will be in the form of beaver dam analogue (BDA) structure installation. Typical structures will require wooden posts pounded into the streambed with a hydraulic post pounder, and some fill collected by shovel from the channel and banks transported by 5-gallon buckets and placed on the upstream side of the BDAs.

#4: Describe the existing project area conditions. The description should include existing conditions, current and historic land uses and previous excavation/fill (if depths and extent is known, please describe).

The main use of the area is recreation (hunting, fishing, horseback riding, etc.). There have been floods, road building, grazing, logging, and houses built within the valley bottom over the past 150 years. Deposition and erosion has occurred with flooding and building activities have reworked the area of home sites. We are unaware of any fill being used.

#5: Will a federal permit be required to complete the scope of work on the project areas located within this worksite?

Yes

#5a: List the agency that will be issuing the permit and the date you anticipate applying for and receiving the permit. Will the federal permit cover ALL proposed ground disturbing activities included in the project?

JARPA

#6: Are you utilizing Federal Funding to complete the scope of work? This includes funds that are being shown as match or not.

No

#7: Do you have knowledge of any previous cultural resource review within the project boundaries during the past 10 years?

Yes

#7a: Summarize the previous cultural resource review; including lead agency and date of review, reference name and numbers, etc. If RCO, include the prior phase grant number. NOTE: Do not provide any site-specific information considered confidential. Attach previous surveys or other reference documents.

Surveys and letters of "no survey required" have been received for all proposed work sites (Charley, North Fork and South Fork Asotin Creek) between 2012-2016. See attached correspondence and permits from 15-1321R.

#8: Is the worksite located within an existing park, wildlife refuge, natural area preserve, or other recreation or habitat site?

Yes

#8a: Please name the area and specify when the site was established.

Asotin Creek Wildlife Management Area established 1962

#9: Are there any structures over 45 years of age within this worksite? This includes structures such as buildings, tidegates, dikes, residential structures, bridges, rail grades, park infrastructure, etc.

No

There are no structures in the proposed restoration area and all work will occur within the active channel.

Worksite #2: South Fork Asotin Creek river mile 0-2.5

Project Application Report - 23-1036

Area: South Fork Asotin Creek

#1: Provide a description of the project actions at this worksite (acquisition, development and/or restoration activities that will occur as a part of this project)

Restoration activities include placing beaver dam analogues (BDA) and post assisted log structures (PALS) in the stream, driving posts into the stream bed to support structures, and minimal use of a mini excavator to remove confining berms. Additional actions would be transporting large wood by hand (or use of a griphoist) from the adjacent floodplain and hillslopes to the stream channel.

#2: Describe all ground disturbing activities (length, width and depth of disturbance and equipment utilized) that will take place in the Area of Potential Effect (APE). Include the location of any construction staging or access roads associated with your project that will involve ground disturbance.

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JARPA

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No

There are no structures in the proposed restoration area and all work will occur within the active channel.

Worksite #3: North Fork Asotin Creek river mile 0-5

Area: North Fork Asotin Creek

#1: Provide a description of the project actions at this worksite (acquisition, development and/or restoration activities that will occur as a part of this project)

Restoration activities include placing beaver dam analogues (BDA) and post assisted log structures (PALS) in the stream, driving posts into the stream bed to support structures, and minimal use of a mini excavator to remove confining berms. Additional actions would be transporting large wood by hand (or use of a griphoist) from the adjacent floodplain and hillslopes to the stream channel.

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JARPA

#6: Are you utilizing Federal Funding to complete the scope of work? This includes funds that are being shown as match or not.

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No

There are no structures in the proposed restoration area and all work will occur within the active channel.

Project Permits

Permits and Reviews	Issuing Organization	Applied Date	Received Date	Expiration Date	Permit #
Cultural Assessment [Section 106]	DAHP				
Endangered Species Act Compliance [ESA]	US Fish & Wildlife				
Hydraulics Project Approval [HPA]	Dept of Fish & Wildlife				
US Army Corps of Engineers					

Permit Questions

#1: Are you planning on using the federal permit streamlining process? **Limit 8**

No

Attachments

Required Attachments	6 out of 6 done
Applicant Resolution/Authorizations	✓
Cost Estimate	✓
Landowner acknowledgement form	✓
Map: Restoration Worksite	✓
Photo	✓
RCO Fiscal Data Collection Sheet	✓

PHOTOS (JPG, GIF)

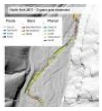
Photos (JPG, GIF)


550926


550927


550928


550929


551065

PROJECT DOCUMENTS AND PHOTOS

Project Documents and Photos

Project Application Report - 23-1036

File Type	Attach Date	Attachment Type	Title	Person	File Name, Number Associations	Sh
	06/20/2023	Visuals	ReviewComments_TablesAndFigures.pdf	ElizabethK	ReviewComments_TablesAndFigures.pdf, 566918	✓
	05/24/2023	Application Review Report	Grant Manager Comments, 23-1036R(rtnd 05/24/23 15:57)	KendallB	Grant Manager Comments Report - 23-1036 (rtnd 05-24-2023_15-57-14).pdf, 563830	✓
	04/14/2023	Project Application Report	Project Application Report, 23-1036R (sub 04/14/23 15:51:51)	AaronP	Project Application Report - 23-1036 (submitted 04-14-2023_15-51-51).pdf, 558252	✓
	04/14/2023	Map: Restoration Worksite	AsotinIMWRestorationWorkSiteMap.jpeg	StephenB	AsotinIMWRestorationWorkSiteMap.jpeg, 558214	✓
	04/14/2023	Visuals	VicinityMap.jpeg	StephenB	VicinityMap.jpeg, 558206	✓
	04/14/2023	Map: Area of Potential Effect (APE)	AsotinIMWRestoration_APE_Map.jpeg	StephenB	AsotinIMWRestoration_APE_Map.jpeg, 558205	✓
	04/14/2023	Cost Estimate	FINAL_AsotinIMW_CostEstimate_2023.xlsx	StephenB	FINAL_AsotinIMW_CostEstimate_2023… 558203	✓
	04/14/2023	Preliminary design report	Basis_Of_Design_Report_AsotinIMW_Rest	StephenB	Basis_Of_Design_Report_AsotinIMW_… 558175	✓
	04/12/2023	Agreement attachment	FY24 TU Indirect Cost Rate Agreement.pdf	AaronP	FY24 TU Indirect Cost Rate Agreement.pdf, 557903	✓
	04/03/2023	Letters of Support	IMW Certification Memo 23-1036.pdf	StephenB	IMW Certification Memo 23-1036.pdf, 556651	✓
	03/08/2023	Applicant Resolution/Authorizations	ApplicantAuthorizationResolution_2023.doc	AaronP	ApplicantAuthorizationResolution_2023… 554070	✓
	03/08/2023	RCO Fiscal Data Collection Sheet	SRFB FiscalDataCollectionSheet..pdf.PDF.pdf	AaronP	SRFB FiscalDataCollectionSheet..pdf.PDF.pdf, 554020	
	02/28/2023	Landowner acknowledgement form	SAL-LandownerAckForm_AsotinCreek_Low-Tech_Restoration&Beaver	StephenB	SAL-LandownerAckForm_AsotinCreek_Low-Tech_Restoration&BeaverRelocation.pdf, 553340	
	02/07/2023	Photo	Fig4c_Connecting_Side-channel_NF_Post.jpg	StephenB	Fig4c_Connecting_Side-channel_NF_Post.jpg, 551068	✓
	02/07/2023	Photo	Fig4b_Connecting_Side-channel_NF_Pre.jpg	StephenB	Fig4b_Connecting_Side-channel_NF_Pre.jpg, 551067	✓
	02/07/2023	Photo	Fig4a_Disconnected_Side-channels_NF.jpg	StephenB	Fig4a_Disconnected_Side-channels_NF.jpg, 551066	✓
	02/07/2023	Photo	Fig4a_Connecting_Side-channel_NF_Pre.jpg	StephenB	Fig4a_Connecting_Side-channel_NF_Pre.jpg, 551065	✓
	02/06/2023	Photo	Fig1_Charley_Creek_Berm_OnRiverLeft.JP	StephenB	Fig1_Charley_Creek_Berm_OnRiverLe… 550929	✓
	02/06/2023	Photo	Fig2_North_Fork_BermOnRiverLeft.JPG	StephenB	Fig2_North_Fork_BermOnRiverLeft.jpg, 550928	✓
	02/06/2023	Photo	Fig3_South_Fork_BermOnRiverLeft.JPG	StephenB	Fig3_South_Fork_BermOnRiverLeft.jpg, 550927	✓
	02/06/2023	Photo	Fig4d_New_Side-channel_NF.JPG	StephenB	Fig4d_New_Side-channel_NF.jpg, 550926	✓
	01/12/2023	Project Review Comments	Project Review Comments Report, 23-1036R (01/12/23 08:38:27)	BartL	Project Review Comments Report - 23-1036 (01-12-2023_08-38-27).pdf, 547790	✓
	01/12/2023	Project Application Report	Project Application Report, 23-1036R (01/12/23 08:38:27)	BartL	Project Application Report - 23-1036 (01-12-2023_08-38-27).pdf, 547789	✓
	01/12/2023	Project Review Comments	Project Review Comments Report, 23-1036C (01/12/23 08:37:47)	BartL	Project Review Comments Report - 23-1036 (01-12-2023_08-37-47).pdf, 547788	✓
	01/12/2023	Project Application Report	Project Application Report, 23-1036C (01/12/23 08:37:46)	BartL	Project Application Report - 23-1036 (01-12-2023_08-37-46).pdf, 547787	✓

Application Status

Application Due Date: 06/27/2023

Project Application Report - 23-1036

Status Name	Status Date	Submitted By	Submission Notes
Application Resubmitted	06/21/2023	Aaron Penvose	Thank you!
Application Returned	05/24/2023	Kendall Barrameda	
Application Submitted	04/14/2023	Aaron Penvose	Thanks for the opportunity and considerations.
Preapplication	01/09/2023		

I certify that to the best of my knowledge, the information in this application is true and correct. Further, all application requirements due on the application due date have been fully completed to the best of my ability. I understand that if this application is found to be incomplete, it will be rejected by RCO. I understand that I may be required to submit additional documents before evaluation or approval of this project and I agree to provide them. (Aaron Penvose, 06/21/2023)

Date of last change: 06/21/2023